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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,299	11/16/2006	Yuto Takagi	035924-0134	1002
22428 7590 11/09/2010 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				
EXAMINER				
AKRAM, IMRAN				
ART UNIT		PAPER NUMBER		
1723				
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11/09/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/566,299

**Applicant(s)**

TAKAGI, YUTO

**Examiner**

IMRAN AKRAM

**Art Unit**

1723

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7-9, 11 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) 15 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-9, 11 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments filed 8/6/10 have been fully considered but they are not persuasive. The reference rejections still apply.
2. Applicant asserts on page 5 of the Arguments that the air supply of Goebel cannot be stopped. Examiner respectfully disagrees. Air supply can be stopped in Goebel by ceasing to supply air. This ability is essential to Goebel since the procedure must be started and stopped at some point during operation. An inability to stop the supply of air would be deleterious to the invention of Goebel.
3. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Goebel may not suggest a benefit to stopping air beyond that mentioned in paragraph 2 above, but the Borup provides motivation to do so.
4. Also, as per paragraph 3 above, Goebel may not disclose the claimed temperature range, but Borup does. Borup disclose a temperature range of 80 to 300 °C, which includes the claimed temperature range of 120 to 200 °C.
5. Applicant asserts on page 6 of the Arguments that Borup does not disclose supplying reformat without air to the PrOx catalyst during startup. Examiner respectfully disagrees. As shown in the rejection below, the catalyst of Borup is activated by raising its temperature by then passing methanol reformat of standard

composition, without additional PrOx air, through the PrOx catalyst for a period of time (column 7, line 62 to column 8, line 3). The fuel cell stack is provided in the primary reference of Goebel and, again, it is their combination that rejects the claims as written, not the references individually.

6. In regards to claim 17, Examiner agrees with Applicant's assertion that neither Goebel nor Borup disclose a wound electric heater. Examiner has taken Official Notice for this well-known feature.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goebel (US 2003/0093950 A1) in view of Borup (US 6,162,558).

10. Regarding claim 7, Goebel discloses a method comprising: a heating step of elevating the temperature of a selective oxidation PrOx **20** (paragraph 31) by opening valve **44** for fuel to be burned in the burner system **24,26** (paragraph 26) and then closing valve **44** and opening valve **46** to allow reformat to flow through the PrOx **20** and have its CO removed with air **92** (paragraph 43). The reformat is produced by the steam reformation of methanol (paragraph 2). Goebel discloses a fuel cell stack **22** and that the heating step, the selective oxidation step, and the carbon monoxide removing step are performed at start-up (paragraph 43). Goebel does not disclose running reformat through the PrOx without additional PrOx air since the catalyst of Goebel is activated by temperature alone (paragraph 11), but Goebel does disclose means to do so as described above.

11. Borup—in an invention for a selective oxidation catalyst for the removal of CO from reformat for a fuel cell—discloses an iridium catalyst that removes CO in an oxidation reaction with air that has a broader temperature and pressure range than the catalyst used in Goebel (column 4, lines 37-44 of Borup). The temperature range includes temperatures from 120 to 200 °C. Given the necessity for temperature control in the PrOx of Goebel, the catalyst of Borup would provide advantages (column 4, lines 45-54 of Borup). The catalyst of Borup is activated by raising its temperature, too, but then passing methanol reformat of standard composition, without additional PrOx air, through the PrOx catalyst for a period of time (column 7, line 62 to column 8, line 3), something which Goebel is capable of. It would have been obvious to one having ordinary skill in the art at the time of invention to replace the PrOx catalyst of Goebel

with the catalyst of Borup for less rigid temperature and pressure parameters for the PrOx device and then running reformat through it without additional PrOx air in order to activate it.

12. Regarding claim 8, Goebel discloses that the heating of the PrOx catalyst can be performed by an electric heater (paragraph 11).

13. Regarding claim 9, Goebel discloses increasing the temperature of the PrOx with the exothermic reaction between the reformat and the air (paragraph 46).

14. Regarding claim 11, Goebel discloses that the burner system for heating the PrOx as above comprises a combustion catalyst **26** (paragraph 23).

15. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goebel and Borup as applied to claim 8 above, and further in view of Kondo (US 5,110,559).

16. Goebel discloses an electric heater for the PrOx catalyst section, but does not disclose the details of the heater configuration. Heaters are well-known to be coiled to increase surface area of heating. Kondo—in an invention for the reformation of hydrocarbons to hydrogen using refining catalysts—discloses the use of an electric heater wound within and around a catalyst layer to provide uniform heating throughout the catalyst (column 8, lines 1-20). It would have been obvious to one having ordinary skill in the art at the time of invention to use the coiled electric heaters of Kondo as the selective oxidation catalyst heater of Goebel to effect uniform heating through the selective oxidation catalyst of Goebel and Borup and increase reaction efficiency.

***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **IMRAN AKRAM** whose telephone number is (571)270-3241. The examiner can normally be reached on 10-7 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/I. A./  
Examiner, Art Unit 1723

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1723